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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,923	10/03/2005	Tomohiro Kawase	20239/0202145-USO	6192
7278	7590	07/25/2007		
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			EXAMINER HITESHEW, FELISA CARLA	
			ART UNIT 1722	PAPER NUMBER
			MAIL DATE 07/25/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,923	Applicant(s) KAWASE, TOMOHIRO	
	Examiner Felisa C. Hiteshew	Art Unit 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: ____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/21/2007;
4/17/2006 & 10/03/2005.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The PTOL 1449 has been received, reviewed and considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP, 3-237088 (Nippon Mining Co., Ltd) in view of JP, 2000-313699 (Japan Energy Corp) and JP, 3-40987 (Nippon Telegraph & Telephone Corp.).

JP '088 and JP '699 both teach the same technical issue for obtaining a high-quality InP single crystal, comprising applying the means of making the density of

foreign matter uniform throughout the crystal through heat treatment as further taught in JP' 699.

The difference being that JP' 088 and JP '699 do not exactly teach an average dislocation density value or growth orientation. However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to add the foreign matter, as taught by JP '088 to solved the technical issue in the large diameter InP single crystal through routine experimentation the optimum, operable product parameter limitations in order to ensure proper orientation.

5. Claims 17-21, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '987 in view Rudolph, et al.

Both JP '987and Rudolph, et al teach a method to produce a single crystal using a seed crystal having a sectional area or at least 15% compared to the crystal body, which could be easily conceived by a person skilled in the art.

6. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '088 in view of JP '987.

JP '088 and JP'987 both teach the same technical issue in the point of obtaining a high-quality compound semiconductor single crystal. It would have been obvious to one of ordinary skill in the art to optimize an modify thee idea of applying the same means of reducing the dislocation density, as taught in JP '088 can be used to solve the shared technical issue in the method to produce single crystals, as taught in JP '987.

7. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '987.

JP '987 teaches a vertical or horizontal Bridgman method for growing single crystals wherein the structure of a crucible is used to enhance the yield or "growth speed" of a raw material and grown crystal by specifying the shape of the utilized seed crystal in a vertical or horizontal Bridgman crystal growing method.

8. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudolph, et al.

Rudolph, et al teaches a vertical Bridgman method for producing InP single crystals containing a sulfur dopant (col. 2, page 43), a pBN crucible (col. 1, page 45) and boron oxide (B₂O₃; col 2, page 45).

The difference being that Rudolph, et al does not teach an inner surface of the Growth container, coated with a boron oxide film, will be exposed to the melt. However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable process parameters limitations in order to ensure proper orientation.

9. Claims 32-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '088 in view of JP '987 and JP '699.

Both JP '088 and JP '987 teach a method of producing a high-quality compound semiconductor single crystal. The idea of applying the means of enlarging the diameter of the single crystal, as taught in, JP '088 can be modified and optimized by the method to produce single crystals, as taught in JP '987.

Both JP '699 and JP '987 both teach the method of producing a high-quality compound semiconductor single crystal.

The difference being that JP' 088 and JP '699 do not exactly teach an average dislocation density value or growth orientation. However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to add the foreign matter, as taught by JP '088 to solved the technical issue in the large diameter InP single crystal through routine experimentation the optimum, operable product parameter limitations in order to ensure proper orientation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felisa Hiteshew whose telephone number is (571) 272-1463. The examiner can normally be reached on Mondays through Thursday from 5:30 AM to 4:00 PM with Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta, can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-1463.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866- 217-9197 (toll-free).


FELISA HITESHEW
PRIMARY EXAMINER